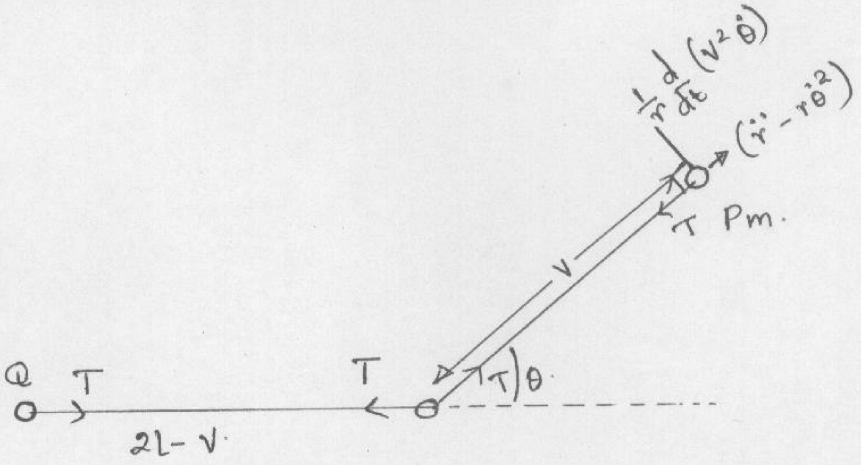

$\underline{F} = ma.$

$0 = m\frac{1}{r}\frac{d}{dt}(v^2\dot{\theta})$

$r^2\dot{\theta} = \text{Constant} = \odot$

$l^2 \cdot \frac{u}{l} = c$

$v^2\dot{\theta} = lu. \Rightarrow \dot{\theta} = \frac{lu}{v^2}$ —— (1)

Applying $\underline{F} = m\underline{a}$

$\nearrow \quad P - T = m(\ddot{r} - v\dot{\theta}^2)$ —— (2).

for Q. $\rightarrow \quad -T = km\frac{d^2}{dt^2}(2L - v)$

$T = km\frac{dv^2}{dt^2} = km\ddot{r}$ —— (3)

from (3) $\frac{T}{km} = \ddot{r}$

Substitute in (2)

$-T = m\left(\frac{T}{km} - \frac{rl^2u^2}{r^4}\right)$

$-\left(1 + \frac{1}{u}\right)T = -\frac{ml^2u^2}{r^4}$

$T = \frac{kml^2u^2}{(k+1)}$